AMENDMENTS TO THE CLAIMS

Claims 1-50 (canceled)

Claim 51 (currently amended): A substrate processing apparatus comprising:

a processing vessel for processing a substrate therein, the substrate having a ~~deposit~~ resist film on a surface thereof;

a substrate holding member for holding the substrate in the processing vessel;

a process gas supply section for supplying a process gas into the processing vessel;

a solvent vapor supply section for supplying a solvent vapor into the processing vessel, the solvent vapor supply section having a solvent heater for generating and heating the solvent vapor;

a main heater for heating the processing vessel;

a control unit for controlling the solvent heater and the main heater to control a temperature of the substrate and a temperature of the solvent vapor such that a mixed gas molecular layer of a mixture of ~~gas~~ molecules of the solvent vapor and molecules of the process gas is formed on the substrate to alter the ~~deposit of the substrate~~ resist film into a water-soluble substance.

Claim 52 (previously presented): The substrate processing apparatus according to claim 51, further comprising:

a gas flow controller for controlling a supply rate of the process gas into the processing vessel; and

a vapor flow controller for controlling a supply rate of the solvent vapor into the processing vessel.

Claim 53 (previously presented): The substrate processing apparatus according to claim 52, wherein the gas flow controller and the vapor flow controller are controlled by the control unit.

Claim 54 (previously presented): The substrate processing apparatus according to claim 52, further comprising a discharge flow controller for controlling a discharge rate from the processing vessel to maintain a pressurized atmosphere in the processing vessel.

Claim 55 (previously presented): The substrate processing apparatus according to claim 51, further comprising a purge gas supply section for supplying a purge gas into the processing vessel to purge the processing vessel of the remaining process gas and solvent vapor.

Claim 56 (previously presented): The substrate processing apparatus according to claim 51, further comprising a hot gas supply section for supplying a hot gas into the processing vessel to heat an atmosphere in the processing vessel.

Claim 57 (previously presented): The substrate processing apparatus according to claim 51, wherein the process gas is an ozone gas and the solvent vapor is a water vapor.

Claim 58 (previously presented): The substrate processing apparatus according to claim 57, further comprising:

a gas flow controller for controlling a supply rate of the ozone gas into the processing vessel; and

a vapor flow controller for controlling a supply rate of the water vapor into the processing vessel.

Claim 59 (previously presented): The substrate processing apparatus according to claim 58, wherein the gas flow controller and the vapor flow controller are controlled by the control unit.

Claim 60 (previously presented): The substrate processing apparatus according to claim 58, further comprising a discharge flow controller for controlling a discharge rate from the processing vessel to maintain a pressurized atmosphere in the processing vessel.

Claim 61 (previously presented): The substrate processing apparatus according to claim 57, further comprising a mist trap connected to the processing vessel, the mist trap including:

a cooling unit for cooling the discharged ozone gas and water vapor from the processing vessel to condense the discharged water vapor into a liquid water; and

a discharge unit for receiving and discharging the ozone gas and the liquid water.

Claim 62 (previously presented): The substrate processing apparatus according to claim 61, wherein an ozone killer for killing the discharged ozone gas is connected to the discharge unit, and a drain for the liquid water is provided on a bottom of the discharge unit.

Claim 63 (previously presented): The substrate processing apparatus according to claim 57, further comprising a purge gas supply section for supplying a purge gas into the processing vessel to purge the processing vessel of the remaining ozone gas and water vapor.

Claim 64 (previously presented): The substrate processing apparatus according to claim 57, further comprising a hot gas supply section for supplying a hot gas into the processing vessel to heat an atmosphere in the processing vessel.